US007513223B2

(12) **United States Patent**
Onodera et al.

(10) **Patent No.: US 7,513,223 B2**
(45) **Date of Patent: Apr. 7, 2009**

(54) **ENGINE-DRIVEN WORK MACHINE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/791,014**

(22) PCT Filed: **Jan. 13, 2006**

(86) PCT No.: **PCT/JP2006/300346**

§ 371 (c)(1), (2), (4) Date: **May 18, 2007**

(87) PCT Pub. No.: **WO2006/077773**

PCT Pub. Date: **Jul. 27, 2006**

(65) **Prior Publication Data**

US 2008/0134996 A1 Jun. 12, 2008

(30) **Foreign Application Priority Data**

Jan. 20, 2005 (JP) 2005-013321

(51) **Int. Cl.**
F01P 1/02 (2006.01)

(52) **U.S. Cl.** **123/41.7**

(58) **Field of Classification Search** 123/41.56, 123/41.6, 41.62, 41.7, 2–3, 41.55, 41.58
See application file for complete search history.

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(57) **ABSTRACT**

An engine-driven work machine is provided in which an engine/work machine unit (**5**) is housed in a box (**30**) and a cooling fan (**15**) for generating a flow of cooling air from an air inlet (**39**) to an air outlet (**40**) via the surroundings of the engine/work machine unit (**5**) is disposed within the box (**30**), wherein a gas/liquid separation chamber (**32**) for restricting the flow of cooling air is provided between the air inlet (**39**) and the engine/work machine unit (**5**), and the gas/liquid separation chamber (**32**) is provided with a first wall face (**32*a*1**) for changing upward flow of cooling air into a lateral direction after it has collided with the first wall face (**32*a*1**) and a second wall face (**32*a*2**) for changing the lateral direction of flow into an obliquely downward direction. This enables mist contained in cooling air taken into the box to be separated and removed effectively before the cooling air reaches the surroundings of the engine/generator unit.

5 Claims, 6 Drawing Sheets

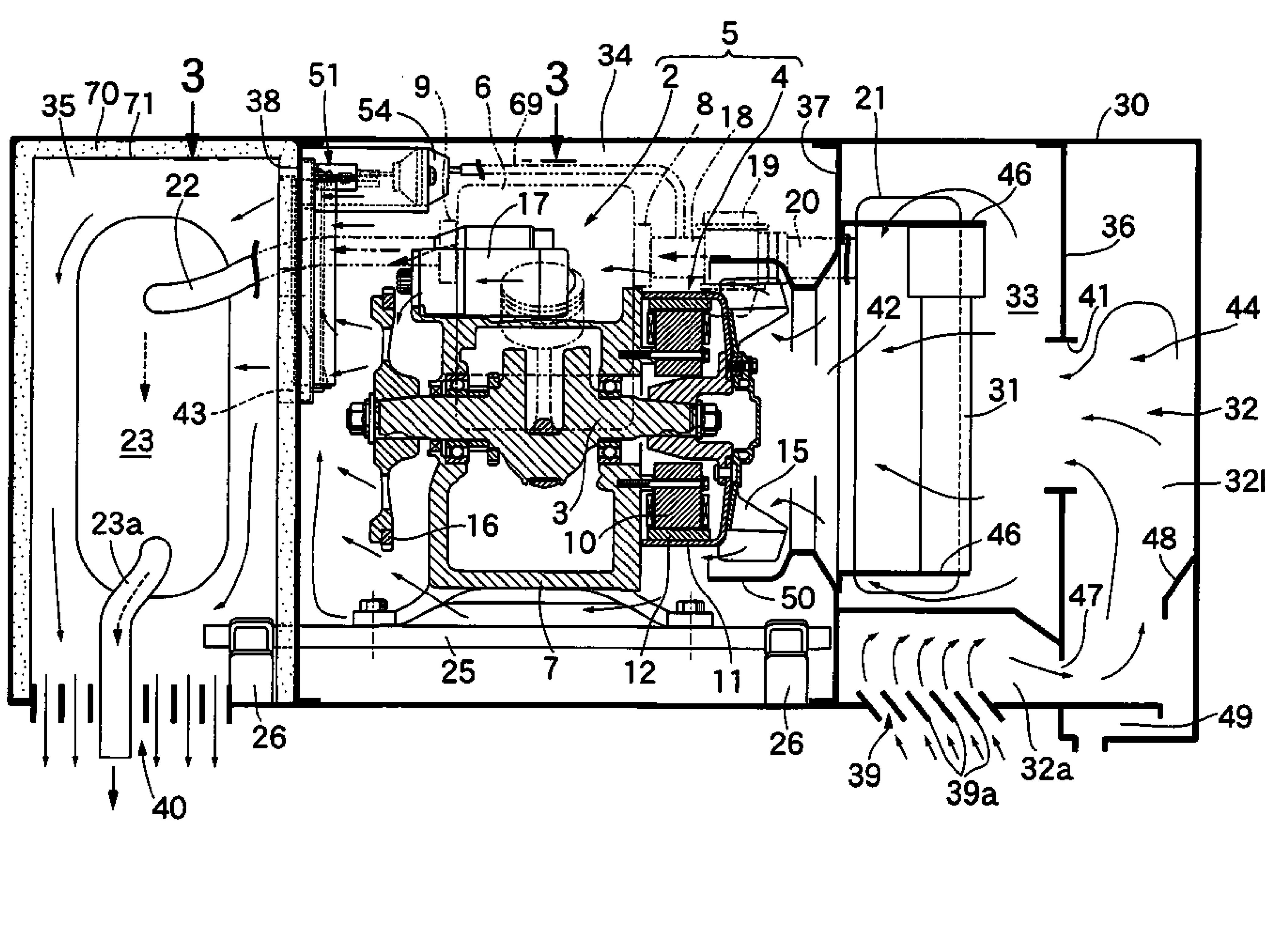

FIG.1

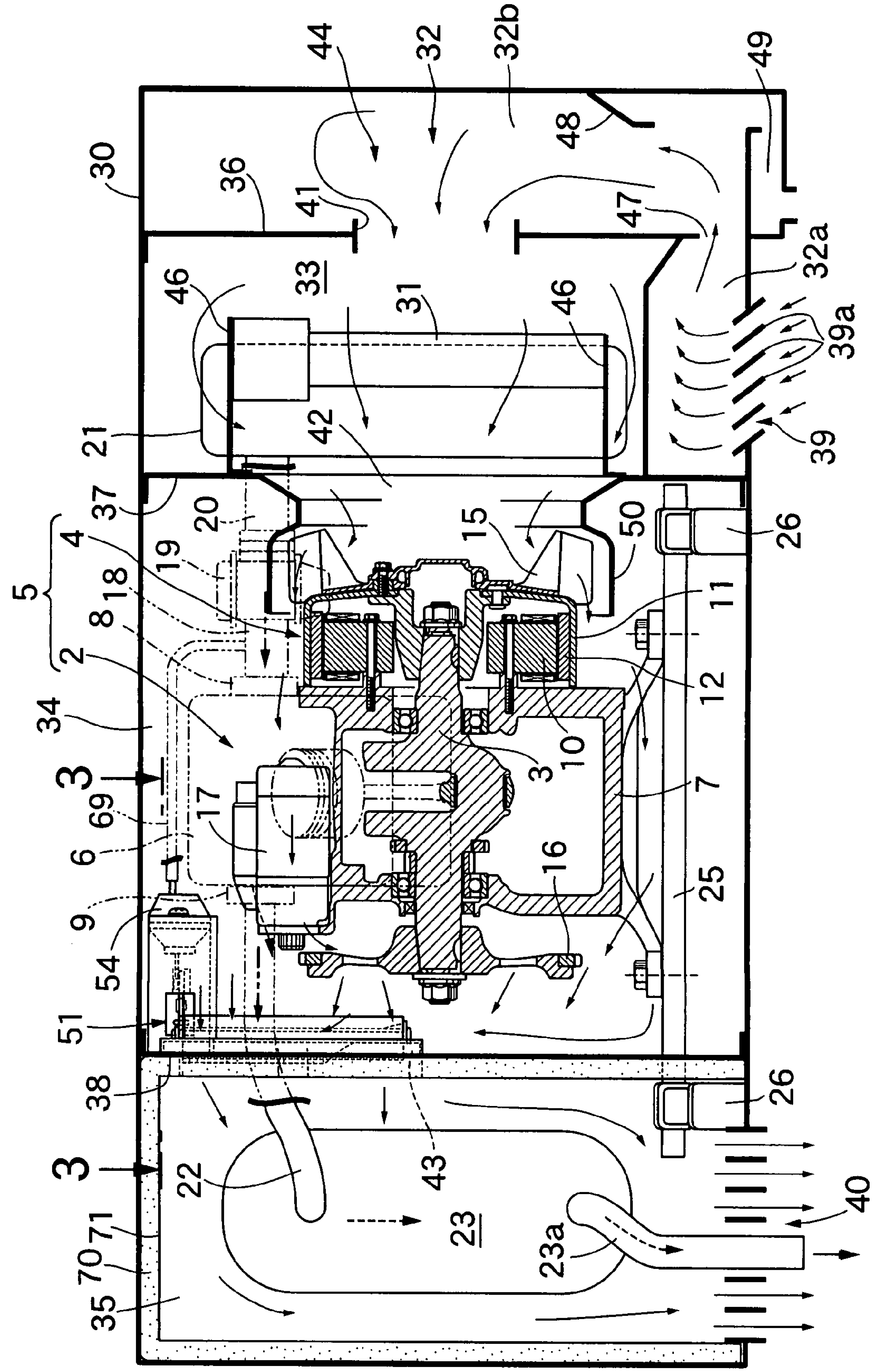
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FIG.2

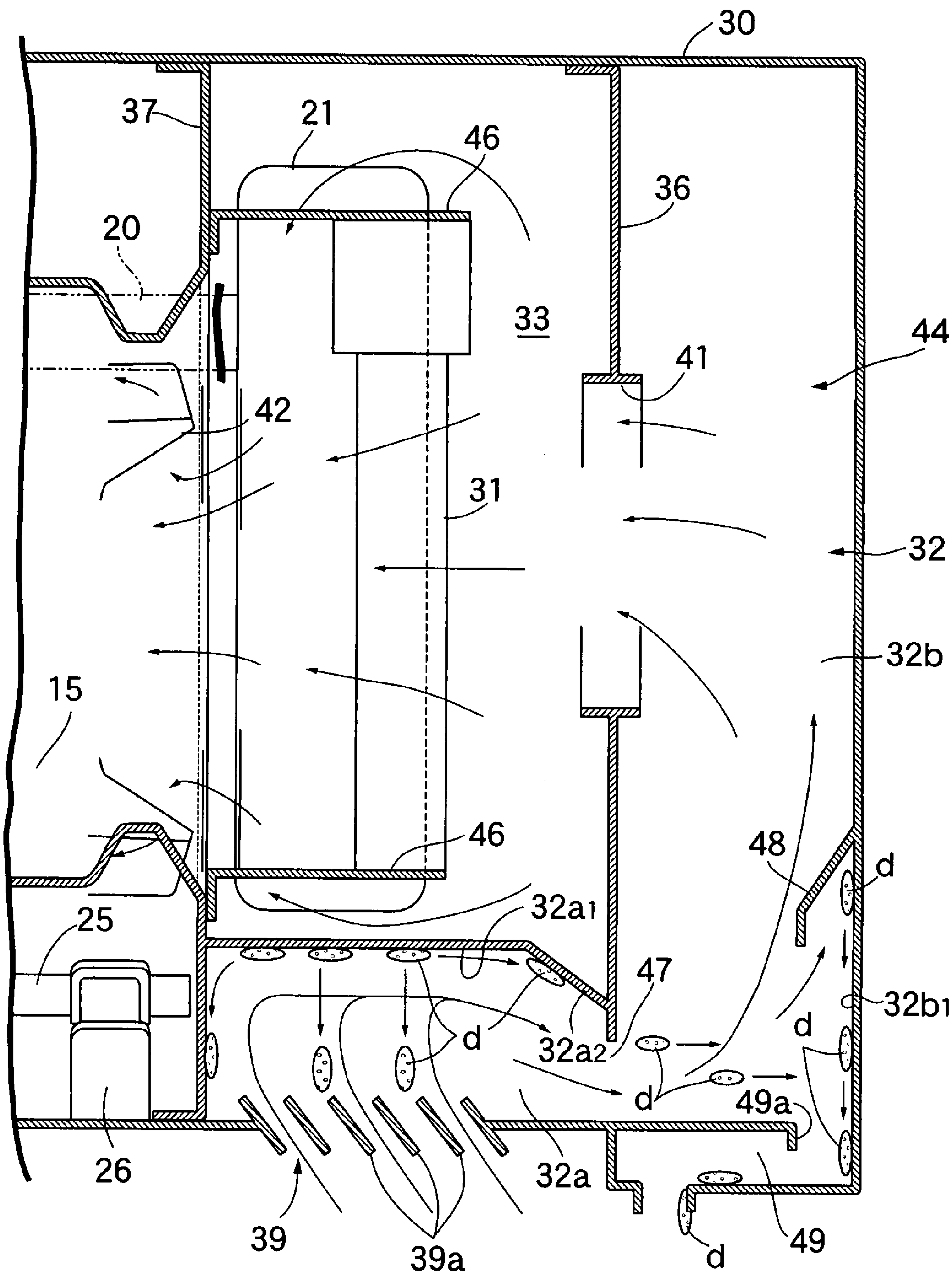
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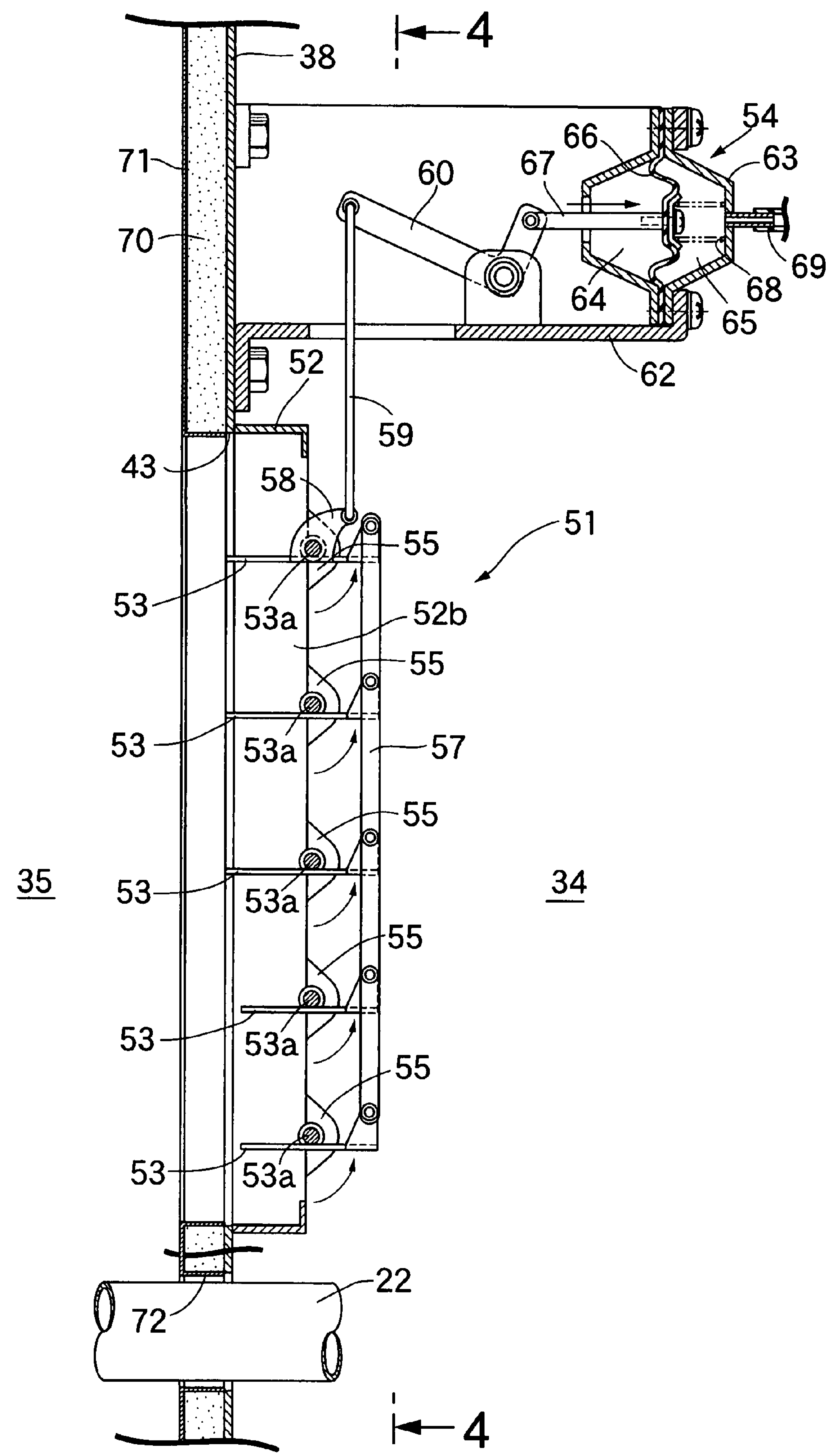
FIG.3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52b
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72
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FIG.4

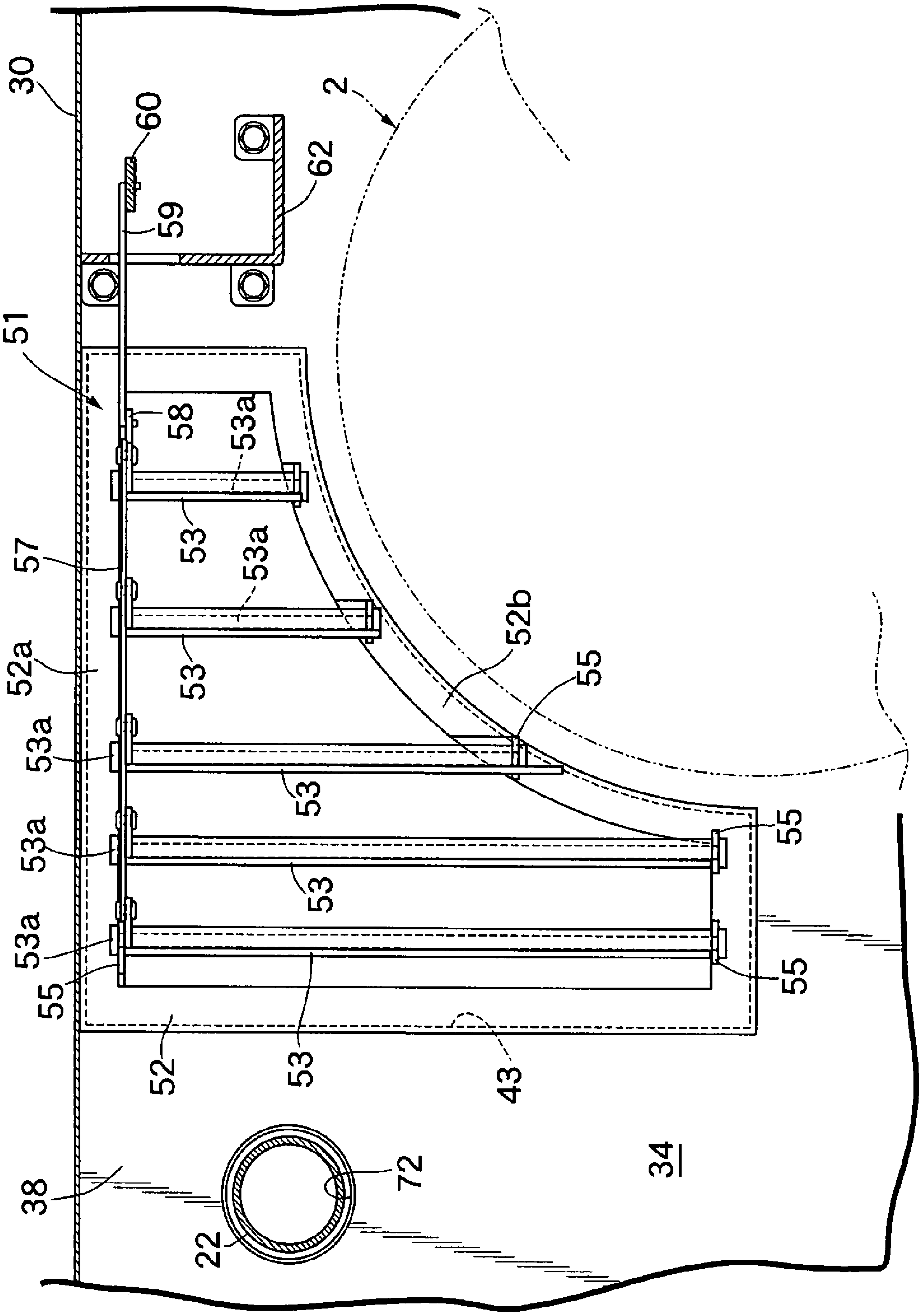
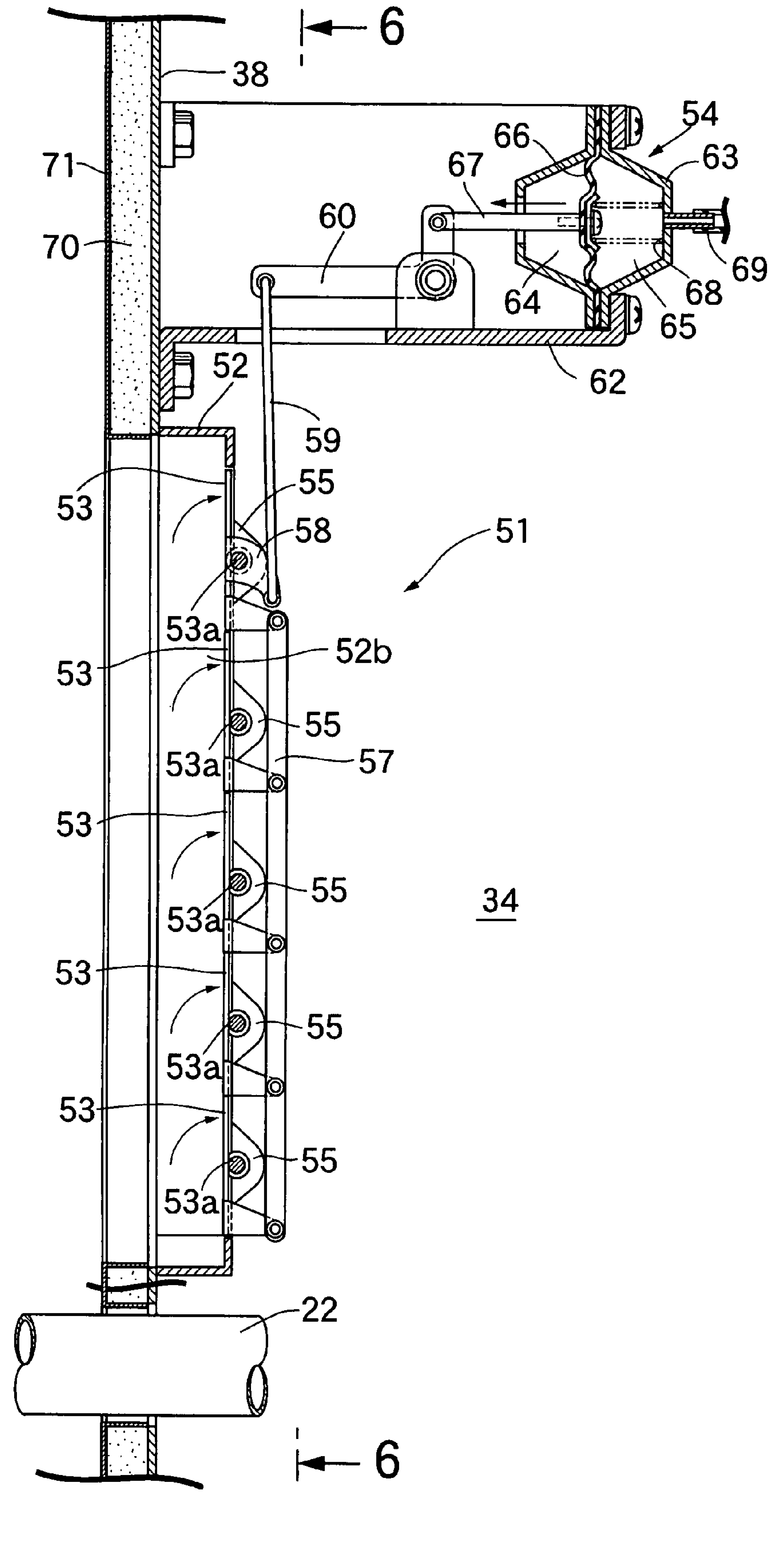


FIG.5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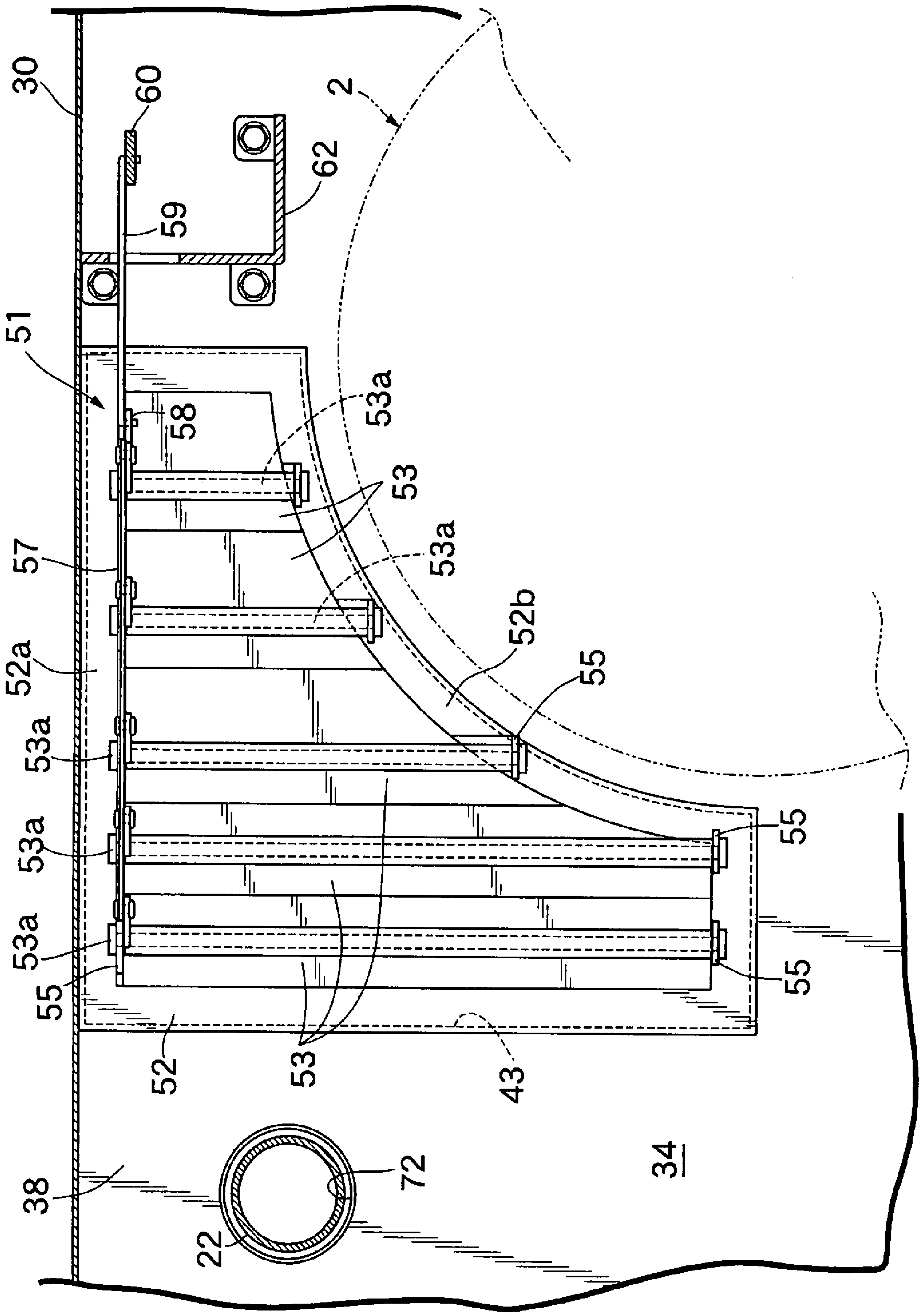
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FIG.6

ENGINE-DRIVEN WORK MACHINE

CROSS REFERENCE TO RELATED APPLICATION

This application is a National Stage entry of International Application No. PCT/JP 2006/300346, filed Jan. 13, 2006, the entire specification claims and drawings of which are incorporated herewith by reference.

TECHNICAL FIELD

The present invention relates to an improvement of an engine-driven work machine in which an engine/work machine unit is formed by joining an engine and a work machine driven by a crankshaft of the engine, the engine/work machine unit is housed in a box, an air inlet and an air outlet open on an outer face of the box, and a cooling fan for generating a flow of cooling air from the air inlet to the air outlet via the surroundings of the engine/work machine unit is disposed within the box.

BACKGROUND ART

Such an engine-driven work machine is already known as disclosed in, for example, Patent Publications 1 and 2.

Patent Publication 1: Japanese Utility Model Registration Publication No. 2-32836

Patent Publication 2: Japanese Patent No. 2739184

DISCLOSURE OF INVENTION

Problems to be Solved by the Invention

Such engine-driven work machines are widely used as engine-driven generators used as a power source for construction work, a power source for outdoor recreation, a power source for emergency use, etc. In this case, the box housing the engine/work machine unit prevents the running noise of the engine/work machine unit from leaking and enhances the quietness of the engine-driven work machine, and such engine-driven work machines have little influence on the surrounding environment even when running at night in an urban area.

In such conventional engine-driven work machines, since the amount, including cooling air, taken into the box is large, means for limiting as much as possible the entry of dust into the interior of the box by forming a labyrinth-like intake pathway or providing a large intake hood is provided. However, although such means is effective in limiting the entry of dust into the interior of the box, it cannot be said that it is always effective in suppressing the entry of mist generated in rainy weather.

It is an object of the present invention to provide an engine-driven generator that enables mist contained in cooling air taken into the box to be separated and removed effectively before the cooling air reaches the surroundings of the engine/generator unit.

Means for Solving the Problems

In order to attain the above object, according to a first aspect of the present invention, there is provided an engine-driven work machine in which an engine/work machine unit is formed by joining an engine and a work machine driven by a crankshaft of the engine, the engine/work machine unit is housed in a box, an air inlet and an air outlet open on an outer face of the box, and a cooling fan for generating a flow of cooling air from the air inlet to the air outlet via the surroundings of the engine/work machine unit is disposed within the box, characterized in that a gas/liquid separation chamber for restricting the flow of cooling air is provided between the air inlet and the engine/work machine unit, and the gas/liquid separation chamber is provided with a first wall face for changing an upward flow of cooling air into a lateral direction after the cooling air has collided with the first wall face, and a second wall face for changing the lateral direction of flow into an obliquely downward direction.

Further, according to a second aspect of the present invention, in addition to the first aspect, the gas/liquid separation chamber has a louver provided in a lower part as the air inlet, and the louver comprises a plurality of guide blades for restricting the direction of inflow of cooling air into the gas/liquid separation chamber so as to be obliquely upward toward the side opposite to the lateral direction.

Moreover, according to a third aspect of the present invention, in addition to the first or second aspect, the gas/liquid separation chamber is formed from a first chamber having the first wall face and the second wall face and a second chamber rising from an end part of the first chamber on the downstream side, the first chamber and the second chamber communicate via a constricted opening, the second chamber is provided with a third wall face for making cooling air that has passed through the constricted opening collide therewith, and the third wall face has a canopy-shaped water droplet trap projectingly provided at a position higher than the constricted opening.

Furthermore, according to a fourth aspect of the present invention, in addition to the third aspect, the second chamber has a drain hole provided in a lower part directly below the water droplet trap.

It should be noted here that the work machine corresponds to a generator **4** of an embodiment of the present invention, which will be described later. The first, second, and third wall faces correspond to a horizontal wall face **32**_a_**1**, an inclined wall face **32**_a_**2**, and a vertical wall face **32**_b_**1** of the embodiment, and the first and second chambers correspond to a horizontal chamber **32**_a_ and a horizontal chamber **32**_b_ of the embodiment.

Effects of the Invention

In accordance with the first aspect of the present invention, when cooling air that contains mist flows into the gas/liquid separation chamber, since the cooling air is made to collide with the first wall face, mist becomes attached to the first wall face, turns into water droplets, and falls. Since the lateral flow of cooling air along the first wall face is subsequently changed obliquely downward by the second wall face, mist remaining in the cooling air turns into water droplets and is thrown off downward. In this way, mist is efficiently separated from the cooling air, and the engine/generator unit can be cooled by cooling air that contains no mist or very little mist.

Furthermore, in accordance with the second aspect of the present invention, cooperation between the louver and the first wall face gives a large change in direction to the flow of cooling air so that it makes a U-turn in the gas/liquid separation chamber, thus enhancing the effect in separating mist.

Moreover, in accordance with the third aspect of the present invention, when cooling air moves from the first chamber to the second chamber, it collides forcefully with the third wall face of the second chamber as a result of the flow rate being increased by the constricted opening, and mist remaining in the cooling air thereby becomes attached to the third wall face, turns into water droplets, and falls. Even if water droplets attached to the third wall face are guided upward by ascending cooling air, they are captured by the water droplet trap, are decelerated, and fall. In this way, remaining mist can be removed efficiently from the cooling air.

Furthermore, in accordance with the fourth aspect of the present invention, water droplets that fall from the water droplet trap or the third wall face of the second chamber facing the constricted opening can be discharged quickly to the outside via the drain hole.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a vertical sectional front view of an engine-driven generator related to the present invention (first embodiment).

FIG. **2** is an enlarged view of the area around a cooling air intake opening in FIG. **1** (first embodiment).

FIG. **3** is an enlarged sectional view along line **3-3** in FIG. **1** (showing blocking means in an open state) (first embodiment).

FIG. **4** is a sectional view along line **4-4** in FIG. **3** (first embodiment).

FIG. **5** is a view, corresponding to FIG. **3**, showing the blocking means in a blocking state (first embodiment).

FIG. **6** is a sectional view along line **6-6** in FIG. **5** (first embodiment).

EXPLANATION OF REFERENCE NUMERALS AND SYMBOLS

1 Engine-driven work machine (engine-driven generator)
2 Engine
3 Crankshaft
4 Work machine (generator)
5 Engine/work machine unit
15 Cooling fan
32 Gas/liquid separation chamber
32*a* First chamber (horizontal chamber)
32*a***1** First wall face
32*a***2** Second wall face
32*b* Second chamber (vertical chamber)
32*b***1** Third wall face
39 Air inlet (air inlet louver)
40 Air outlet (air outlet louver)
47 Constricted opening
48 Water droplet trap
49 Drain hole

BEST MODE FOR CARRYING OUT THE INVENTION

A mode for carrying out the present invention is explained by reference to a preferred embodiment of the present invention shown in the drawings.

EMBODIMENT 1

First, in FIG. **1**, an engine-driven generator **1** as an engine-driven work machine includes an engine/work machine unit **5** formed by joining an engine **2** and a generator **4** driven by a crankshaft **3** of the engine **2**. The engine **2** is a 4 cycle type, a cylinder portion **6** thereof projects obliquely upward toward one side from a crankcase **7** housing and supporting the crankshaft **3**, and an intake port **8** and an exhaust port **9** open on a right-hand side face and a left-hand side face respectively of the cylinder portion **6**.

The generator **4** is formed from a stator **10** fixed to a right-hand side face of the crankcase **7** and a bottomed cylindrical outer rotor **11** fixed to a right-hand end portion of the

crankshaft **3** extending through a right-hand side wall of the crankcase **7**, and the outer rotor **11** includes a plurality of permanent magnets **12** fixed to an inner peripheral face thereof and arranged in the peripheral direction. This generator **4** is therefore a so-called magnet outer rotor multi-pole generator. The outer rotor **23** has a centrifugal cooling fan **15** mounted on an outer end face thereof, the cooling fan **15** having a larger diameter than that of the outer rotor **23**. A ring gear **16** is fixed to a left-hand end portion of the crankshaft **3**, and a starter motor **17** is mounted on the crankcase **7** or the cylinder portion **6**, the starter motor **17** being capable of cranking the crankshaft **3** via the ring gear **16**.

A carburetor **19** is mounted on a right-hand side face of the cylinder portion **6** via an intake pipe **18** communicating with the intake port **8**, and an air cleaner **21** is connected to an intake path entrance of the carburetor **19** via an intake duct **20**. An exhaust muffler **23** is connected to a left-hand side face of the cylinder portion **6** via an exhaust pipe **22** communicating with the exhaust port **9**.

The crankcase **7** of the engine **2** is supported on an engine bed **25**, and this engine bed **25** is supported on a machine stand **26** via an elastic member, which is not illustrated. The engine **2**, the generator **4**, the carburetor **19**, the air cleaner **21**, and the exhaust muffler **23** are housed in a rectangular parallelepiped box **30**, and a bottom wall of this box **30** is joined to the machine stand **26**. An electrical component **31** (e.g. an inverter) for controlling the output of the generator **4** is disposed adjacent to the air cleaner **21**.

The box **30** is equipped with first to third dividing walls **36** to **38**, which compartmentalize the interior of the box **30** into a gas/liquid separation chamber **32** for taking in outside air and separating water droplets, etc. from the outside air, an electrical component chamber **33** having the electrical component **31** and the air. cleaner **21** disposed therein, a unit chamber **34** having the engine/work machine unit **5** disposed therein, and a muffler chamber **35** having the exhaust muffler **23** disposed therein. An air inlet louver **39** is provided in a bottom wall of the gas/liquid separation chamber **32**. The first dividing wall **36** is provided with a first communicating opening **41** providing communication between the gas/liquid separation chamber **32** and the electrical component chamber **33**, the second dividing wall **37** is provided with a second communicating opening **42** providing communication between the electrical component chamber **33** and the unit chamber **34**, and the third dividing wall **38** is provided with a third communicating opening **43** providing communication between the unit chamber **34** and the muffler chamber **35**. An air outlet louver **40** is provided in a bottom wall of the muffler chamber **35**, and a tail pipe **23***a* of the exhaust muffler **23** is disposed so as to run through the air outlet louver **40**.

The air inlet louver **39**, the gas/liquid separation chamber **32**, the first communicating opening **41**, the electrical component chamber **33**, the second communicating opening **42**, the unit chamber **34**, the third communicating opening **43**, the muffler chamber **35**, and the air outlet louver **40** thereby form a cooling air passage **44** running around the electrical component **31**, the engine/work machine unit **5**, and the exhaust muffler **23**.

The electrical component **31** is supported by a pair of upper and lower stays **46** and **46** which are made to project from the second dividing wall **37** toward the electrical component chamber **33** side. In this arrangement, the electrical component **31** is disposed with a fixed spacing from the first dividing wall **36** so as not to block the first communicating opening **41**. The intake duct **20**, which provides communication between the air cleaner **21** and the carburetor **19**, runs through the first dividing wall **36**.

As is clearly shown in FIG. **2**, the gas/liquid separation chamber **32** is formed from a horizontal chamber **32***a*, which has the air inlet louver **39** in its bottom wall and extends horizontally, and a vertical chamber **32***b*, which rises from a right-hand end part of the horizontal chamber **32***a*, and the horizontal chamber **32***a* and vertical chamber **32***b* communicate via a constricted opening **47**. The vertical chamber **32***b* communicates with the electrical component chamber **33** via the first communicating opening **41**.

The air inlet louver **39**, which is provided in the bottom wall of the horizontal chamber **32***a*, includes a plurality of guide blades **39***a* for directing air that is taken into the horizontal chamber **32***a* in a direction opposite to that of the vertical chamber **32***b*. A horizontal wall face **32***a***1** on the ceiling side of the horizontal chamber **32***a* is formed relatively low so that air that has passed through the air inlet louver **39** collides with the horizontal wall face **32***a***1**, and an end portion of the horizontal wall face **32***a***1** that is adjacent to the constricted opening **47** is formed as an inclined wall face **32***a***2**, which is inclined toward the constricted opening **47**.

Furthermore, a vertical wall face **32***b***1** of the vertical chamber **32***b* that faces the constricted opening **47** is disposed relatively close to the constricted opening **47** so that air that has passed through the constricted opening **47** collides with the vertical wall face **32***b***1**, and the vertical wall face **32***b***1** is equipped with a water droplet trap **48**, which projects in a canopy shape in a middle section between the constricted opening **47** and the first communicating opening **41**. A drain hole **49** is formed in the bottom wall of the vertical chamber **32***b*, the drain hole **49** bending in a labyrinth shape and opening on the lower face of the box **30** and, in particular, an opening **49***a* of this drain hole **49** to the vertical chamber **32***b* is disposed directly below the water droplet trap **48**.

Referring again to FIG. **1**, the second dividing wall **37** has a fan cover **50** provided so as to be connected thereto, the fan cover **50** extending from the peripheral edge of the second communicating opening **42** and covering the outer periphery of the cooling fan **15**, and the cooling fan **15** guiding to the outer periphery of the engine/work machine unit **5** air that has been taken in via the first communicating opening **41**.

In FIG. **1**, FIG. **3**, and FIG. **4**, the third dividing wall **38** is provided with blocking means **51** for closing the third communicating opening **43**. This blocking means **51** is formed from a frame body **52** mounted on the third dividing wall **38** so as to surround the third communicating opening **43** on the unit chamber **34** side, a plurality of valve plates **53** axially supported on the frame body **52** so as to open and close, and an actuator **54** disposed in the unit chamber **34** so as to make the valve plates **53** open and close. Each of the valve plates **53** includes a valve shaft **63***a* rotatably supported by a pair of upper and lower brackets **55** and **55** formed on an upper frame **52***a* and a lower frame **52***b* of the frame body **52**, and all the valve plates **53** are connected to one common synchronous link **57** for synchronizing opening and closing operations.

Among the plurality of valve plates **53**, the outermost valve plate **53** has an operating arm **58** formed on one end part, and the actuator **54** is coupled to this operating arm **58** via a link **59** and a bellcrank **60**.

The actuator **54** is formed from a shell **63** fixedly supported by a stay **62** secured to the third dividing wall **38** in the unit chamber **34**, a diaphragm **66** that compartmentalizes the interior of the shell **63** into an atmospheric chamber **64** on the bellcrank **60** side and a negative pressure operating chamber **65** on the opposite side, an operating rod **67** connected to a central part of the diaphragm **66**, running through the atmospheric chamber **64**, and projecting outside the shell **63**, and a return spring **68** housed in the negative pressure operating chamber **65** and urging the diaphragm **66** toward the atmospheric chamber **64** side. The atmospheric chamber **64** is open to the atmosphere, the negative pressure operating chamber **65** communicates with the interior of the intake pipe **18** via a negative pressure guide tube **69**, and while the engine **2** is running intake negative pressure is introduced into the negative pressure operating chamber **65**.

The bellcrank **60** is axially supported by the stay **62**, has the operating rod **67** connected to one end, and has the other end connected to the operating arm **58** via the link **59**.

While the engine **2** is running, when the intake negative pressure generated within the intake pipe **18** is introduced into the negative pressure operating chamber **65**, the negative pressure acts so as to displace the diaphragm **66** toward the negative pressure operating chamber **65** side and pull the operating rod **67**, this pulling force is transmitted to the operating arm **58** via the bellcrank **60** and the link **59**, and by pivoting the operating arm **58** in an anticlockwise direction as shown in FIG. **3** all the valve plates **53** open simultaneously. When running of the engine **2** is stopped, the intake negative pressure disappears from the intake pipe **18** and the intake path of the carburetor **19**; since the negative pressure of the negative pressure operating chamber **65** is also lost, the diaphragm **66** therefore pushes out the operating rod **67** by means of the urging force of the return spring **68**, this pushing force is transmitted to the operating arm **58** via the bellcrank **60** and the link **59**, and by pivoting the operating arm **58** in a clockwise direction as shown in FIG. **5** all the valve plates **53** are closed simultaneously.

As shown in FIG. **1** and FIG. **3**, a heat-insulating layer **70** made of a heat-insulating material such as glass wool is bonded to the entire inner face of the muffler chamber **35**, and the entire inner face of the heat-insulating layer **70** is covered with a thermally conductive body **71** made of aluminum foil, etc.

The exhaust pipe **22** is arranged so as to run through a series of through holes **72** provided in the third dividing wall **38**, the heat-insulating layer **70**, and the thermally conductive body **71**.

The operation of this embodiment is now explained.

When the engine **2** is run, air that has been filtered by the air cleaner **21** within the electrical component chamber **33** and that is accompanied by fuel in the carburetor **19** is taken into the engine **2** through the intake pipe **18**. The intake negative pressure generated within the intake pipe **18** due to the above intake action of the engine **2** is transmitted to the negative pressure operating chamber **65** of the actuator **54** via the negative pressure guide tube **69**, and the diaphragm **66** pulls the operating rod **67** as described above to thus open all the valve plates **53** simultaneously and thereby open the third communicating opening **43** (see FIG. **3** and FIG. **4**). The cooling air passage **44** from the air inlet louver **39** to the air outlet louver **40** therefore attains an open state.

Since the crankshaft **3** of the engine **2** rotates the outer rotor **11** of the generator **4** and the cooling fan **15** simultaneously, the generator **4** attains a generating state, and the power thus generated is taken out to the outside via a control panel (not illustrated). The rotating cooling fan **15** takes in outside air as cooling air from the air inlet louver **39** via the gas/liquid separation chamber **32**, the first communicating opening **41**, the electrical component chamber **33**, and the second communicating opening **42**, and as shown by arrows makes it pass in sequence through the unit chamber **34**, the third communicating opening **43**, and the muffler chamber **35**, and makes it flow to the outside via the air outlet louver **40**. In this process, in sequence, the electrical component **31** is cooled by cooling air passing through the electrical component chamber

33, the engine **2** and the generator **4** are cooled by cooling air passing through the unit chamber **34**, and the exhaust muffler **23** is cooled by cooling air passing through the muffler chamber **35**.

Moreover, since the engine **2**, the generator **4**, the cooling fan **15**, the exhaust muffler **23**, etc. are entirely covered by the box **30**, running noise generated therefrom can be blocked effectively by the box **30**, and quietness can be achieved for the engine-driven generator **1**.

When it is raining or there is a dense fog, mist might be taken into the air inlet louver **39** together with the cooling air, and the mist is separated and removed from the cooling air by the gas/liquid separation chamber **32** as follows.

That is, when mist-containing cooling air first flows via the air inlet louver **39** into the horizontal chamber **32***a* of the gas/liquid separation chamber **32**, since the cooling air is directed obliquely upward in a direction opposite to the vertical chamber **32***b* by means of the plurality of guide blades **39***a* of the louver **39**, after colliding with the horizontal wall face **32***a***1** on the ceiling, the flow of cooling air undergoes a large change in direction so as to make a U-turn toward the vertical chamber **32***b* along the horizontal wall face **32***a***1**, the mist contained in the cooling air is centrifugally separated from the cooling air due to a difference in specific gravity, becomes attached to the horizontal wall face, and falls down as water droplets d. Subsequently, horizontal flow of the cooling air along the horizontal wall face **32***a***1** is changed obliquely downward by the inclined wall face **32***a***2**, and mist remaining in the cooling air turns into water droplets, which are thrown off downward and separated.

Furthermore, since, when the cooling air moves from the horizontal chamber **32***a* to the vertical chamber **32***b* via the constricted opening **47**, its flow is accelerated by means of the constricted opening **47**, the cooling air collides forcibly with the vertical wall face **32***b***1** of the vertical chamber **32***b*, and mist remaining in the cooling air becomes attached to the vertical wall face **32***b***1**, turns into water droplets d, and falls down. Furthermore, even if water droplets d attached to the vertical wall face **32***b***1** are guided upward by the ascending cooling air, they are captured by the water droplet trap **48**, are decelerated, and fall.

The water droplets d that have fallen from the vertical wall face **32***b***1** and the water droplet trap **48** quickly flow out to the outside via the drain hole **49** directly below the water droplet trap **48**.

Since mist can thus be separated from cooling air efficiently and the electrical component **31**, the engine **2**, the generator **4**, and the exhaust muffler **23** can be cooled by cooling air that contains no mist or very little mist, it is possible to prevent mist from affecting the electrical component **31**, the engine **2**, the generator **4**, and the exhaust muffler **23**, and it is also possible for the engine **2** to take in through the air cleaner **21** air that contains no mist or very little mist. Furthermore, since both the air inlet louver **39** and the air outlet louver **40** are mounted on the bottom wall of the box **30**, it is possible to easily prevent rain from entering these louvers **39** and **40**.

When running of the engine **2** is stopped, the intake negative pressure within the intake pipe **18** disappears, negative pressure of the negative pressure operating chamber **65** of the actuator **54** also disappears, and as described above the diaphragm **66** pushes out the operating rod **67** by means of the urging force of the return spring **68** so as to close all the valve plates **53** simultaneously, thus closing the third communicating opening **43** (see FIG. **5** and FIG. **6**). This allows communication between the unit chamber **34** and the muffler chamber **35** to be blocked. By allowing the high temperature exhaust muffler **23** to stand and gradually cool in the muffler chamber **35** the heat of the exhaust muffler **23** can be prevented from affecting the engine/work machine unit **5** or the outer face of the box **30** and, moreover, since it is unnecessary for the air outlet to be large or to open upward, it is possible to ensure that the box **30** is soundproof.

In particular, since the heat-insulating layer **70**, which is made of a heat-insulating material such as glass wool, is bonded to the entire inner face of the muffler chamber **35**, and the entire inner face of the heat-insulating layer **70** is covered with the thermally conductive body **71**, which is made of aluminum foil, etc., radiant heat that the thermally conductive body **71** receives from the exhaust muffler **23** is dispersed throughout the heat-insulating layer **70**, thus preventing the heat-insulating layer **70** from being locally overheated, and the entire heat-insulating layer **70** cools gradually, thus promoting equal and gradual cooling of the entire muffler chamber **35**, and thereby reliably preventing heat of the exhaust muffler **23** from affecting the engine/work machine unit **5** or the outer face of the box **30**.

Furthermore, since the valve plates **53** are opened and closed by putting the actuator **54** in an operative or inoperative state according to the presence or absence of intake negative pressure of the engine **2**, it is possible to automatically control the open and closed states of the valve plates **53** according to whether the engine **2** is running or is stopped.

The present invention is not limited to the above-mentioned embodiment, and may be modified in a variety of ways as long as the modifications do not depart from the spirit and scope thereof. For example, the actuator **54** may be formed as an electromagnetic type in which its operation is controlled by a switch that detects the presence or absence of intake negative pressure of the engine **2**.

The invention claimed is:

1. An engine-driven work machine in which an engine/work machine unit is formed by joining an engine and a work machine driven by a crankshaft of the engine, the engine/work machine unit is housed in a box, an air inlet and an air outlet are open on an outer face of the box, and a cooling fan for generating a flow of cooling air from the air inlet to the air outlet via surroundings of the engine/work machine unit is disposed within the box,

wherein a gas/liquid separation chamber for restricting the flow of cooling air is provided between the air inlet and the engine/work machine unit, and the gas/liquid separation chamber comprises a horizontal chamber in communication with the air inlet and a vertical chamber connected to the horizontal chamber, an electrical component chamber is provided in the box between the engine/work machine unit and the vertical chamber of the gas/liquid separation chamber, said horizontal chamber being positioned below the electrical component chamber, said gas/liquid separation chamber being provided with a first wall face for defining the horizontal chamber and changing an upward flow of cooling air into a lateral direction after the cooling air has been taken from the air inlet into the horizontal chamber and collided with the first wall face, and a second wall face for changing the lateral direction of flow into an obliquely downward direction and guiding the cooling air into the vertical chamber, and wherein the cooling air in the vertical chamber flows into the electrical component chamber and then towards the engine/work machine unit in a direction opposite the direction of cooling air flowing from the horizontal chamber to the vertical chamber.

2. The engine-driven work machine according to claim **1**, wherein the gas/liquid separation chamber has a louver provided in a lower part as the air inlet, and the louver comprises a plurality of guide blades for restricting the direction of inflow of cooling air into the gas/liquid separation chamber so as to be obliquely upward toward the side opposite to said lateral direction.

3. The engine-driven work machine according to claim **1** or **2**, wherein the horizontal chamber and the vertical chamber communicate via a constricted opening, the vertical chamber is provided with a third wall face for making cooling air that has passed through the constricted opening collide therewith, and the third wall face has a canopy-shaped water droplet trap projectingly provided at a position higher than the constricted opening.

4. The engine-driven work machine according to claim **3**, wherein the vertical chamber has a drain hole provided in a lower part directly below the water droplet trap.

5. The engine-driven work machine according to claim **1**, wherein the engine-driven work machine is a generator.

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